Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

SHORTER ARTICLES AND DISCUSSION

TERMS RELATING TO GENERIC TYPES

In the field of biological taxonomy an important reform is in progress. The change is from the method of concepts to the method of types, in order that names may be applied with greater precision and permanence. Under the method of types we no longer think of the technical name of a plant or an animal as attaching primarily to a concept embodied in a description or definition, but as relating to the first representative of the group that became known to science. In determining the application of a specific name we go back to the original specimen or type on which the description was based. The original description has become secondary to the original specimen. In like manner generic names are treated as relating primarily to groups of species, with the original species as the generic type.[1]

Without waiting to appreciate the fundamental nature of the change from concepts to types, many systematic workers took it for granted that generic types were to be determined by elimination, in much the same way that generic concepts had been treated, by gradual subdivision, restriction and removal of component groups. The general results of elimination were the same as under the method of concepts. The applications of many of the older generic names did not become definitely fixed, but remained dependent upon varying individual opinions of the validity of the work of later authors. It often happened that after elimination was accomplished only the doubtful or unidentifiable species remained to serve as generic types. Gradually it became apparent that the practise of elimination was inconsistent with the method of types, and could not insure stability in the application of names. Recourse was then had, especially by zoologists, to the arbitrary designation of generic types, the apparent object being to preserve the results of elimination, even though the theory had to be abandoned. Probably it is only a question of time until the results of elimination will be discarded, as well as the theory, and replaced by the actual, historical types.

---

[1] Cook, O. F., 1898, ''The Method of Types,'' *Science*, N. S., 8: 513; also 1900, ''The Method of Types in Botanical Nomenclature,'' *Science*, N. S., 12: 475, and 1902, ''Types and Synonyms,'' *Science*, N. S., 15: 646. Swingle, Walter T., 1913, ''Types of Species in Botanical Taxonomy,'' *Science*, N. S., 37: 864.

A plan for determining the historical types of genera was adopted in 1907 in the American Code of Botanical Nomenclature, and other applications of the method of types are being rocognized by zoologists. Specialists in many groups are engaged in the study of generic types, and the need of a special terminology to facilitate work of this kind is becoming apparent. Thus in Bulletin 83 of the U. S. National Museum, ''Type Species of the Genera of Ichneumon Flies,'' by Henry L. Viereck, two new terms, ''isogenotypic'' and ''monobasic,'' are employed in treating of the application of generic names to type species. The paper is of interest, not only to students of this group of insects, but also as an example of the tasks that confront all taxonomists who appreciate the need of basing their work upon types. The distinctions to which the special terms refer are undoubtedly useful, and the possibilities of expressing them in more convenient form are worthy of consideration.

The word ''isogenotypic,'' is used with reference to cases where two or more generic names have been applied to the same type species.[2] For this purpose a new term is not needed unless zoologists are unwilling to borrow from botanical nomenclature a more convenient method of treating the same class of cases. The botanical code provides a classification of synonyms, and applies the word ''typonym'' to a name that has to be rejected because an earlier valid name was proposed for the same type. The formation and use of typonym are in accord with a familiar analogy. As a preoccupied name becomes a homonym, it is easy to remember that the use of a preoccupied type results in a typonym. A name based on a different type species, but congeneric with the type of an older genus, is termed a metonym. A name rejected for lack of an identified type is a hyponym, and one rejected for linguistic reasons, a caconym. All rejected names fall readily into these five classes.

---

[2] A different combination might have been expected, such as ''autogenotypic'' or ''deuterogenotypic,'' since isogenotypic suggests the notion of equally good types or of equal numbers of types, instead of conveying the idea of one and the same type, or of a second use of the same type. Genera have been termed ''isotypical'' when they were described from more than one species, but all truly congeneric, on the assumption that such species would have equal standing as types. A still older use of the word ''isotype'' had reference to equal representation of a genus by similar or corresponding species in different geographical regions or geologic periods. See Schuchert, Charles, 1905, U. S. National Museum Bulletin 53, Pt. 1: 16.

The other new term, ''monobasic,'' is used by Mr. Viereck to indicate genera with only one species at the original place of publication. In botanical literature the word ''monotypic'' is often employed in this sense, though also applied to genera that consist of only one species. If previous use disqualifies monotypic, the same objection lies against monobasic. In addition to an older chemical meaning, the same word was employed several years ago in a biological sense, to describe a condition of descent in simple lines.[3] Apart from being preoccupied, the word monobasic has a misleading implication, since under the method of types each generic name is referred to a single type species. The idea of a genus being based on many types is discarded with the method of concepts. Appreciation of this incongruity may explain why no such term as ''symbasic'' or ''polybasic'' is used in contrast with monobasic, to indicate genera that were first proposed in connection with more than one species.

Evidently there is need of a simple and consistent terminology for indicating relations between generic names and type species. The normal relation under the method of types is the designation of the type species at the original place of publication of the genus. Genera provided with types by original designation may be described as *orthotypic,* or normal-typed. With orthotypic genera there is no occasion to raise the question of how many species were included at the original place of publication.

---

[3] Cook, O. F., and Swingle, W. T., 1905, ''Evolution of Cellular Structures,'' Bull. 81, Bureau of Plant Industry, U. S. Department of Agriculture, p. 20. Plants or animals with specialized habits of asexual reproduction, such as vegetative propagation, parthenogenesis or self-fertilization, would be described as monobasic. The second edition of the Standard Dictionary defines monobasis as follows: ''The derivation of a stock from a single parentage by inbreeding, or by propagation of buds or cuttings; opposed to symbasis.'' Thus the danger of ambiguity in using monobasis for nomenclatorial purposes is greater than in using monotypic, though it must be admitted that the use of the word monotypic in two senses may sometimes result in confusion. Genera that were monotypic in the strictly nomenclatorial sense of being established in connection with one species may not be monotypic in the more general taxonomic sense of including only one species.

Genera that are not orthotypic fall into the two classes already considered, those with a single species at the original place of publication, and those with two or more species. It is now generally agreed that when only one species was mentioned this should be accepted as the type. Such genera may be called *haplotypic,* or single-typed. When two or more species were included in the original treatment of a genus, and no type was designated, we have the problem of subsequent determination of the type, resulting in what may be termed a *logotypic* genus, that is, a genus with a rationally selected type species. The object of selection is to determine the historical type of the genus. Names must have definite applications, and historical applications of generic names can be made definite by ascertaining the historical types. The recognition of a new generic group is usually based on one leading or dominant species, with the others added as associate members.

In many cases the generic type is intimated by the original author in dividing the genus into subgenera or sections, in illustrating one of the species or citing illustrations published in earlier works, in naming the genus with particular reference to one of the species, in recording economic uses, or in giving geographical or other indications of greater familiarity with one of the species. If the application of these or other historical criteria leaves more than one species eligible for selection, the first of the eligible species should be taken as logotype. In this way it is possible to develop a consistent system of type selection that will commend itself as reasonable and give the same results in the hands of different students.[4]

---

[4] Simply taking the first species under a generic name as the type would probably establish more of the generic names in their historical places than the method of elimination, which accepts the last of the original species left in the genus as the type. Either of these methods of selecting types would result in many cases of separation of generic names from their historical types, but these undesirable changes in the application of names can be avoided by taking the historical considerations more directly into account, as in the American Code of Botanical Nomenclature. Probably a more satisfactory system for associating generic names with their historical types could be developed by sufficient study of the problem. A policy of refusing to revive generic names that were not directly associated with binomial species to serve as types, would avoid many of the changes threatened by unmitigated priority. In proposing lists of "*nomina utique conservanda*" in advance of any provision for the definite application of names, European botanists have demonstrated one more way to put the cart before the horse.

In addition to the three ways of associating generic names with their type species, there are many cases where generic names have been applied to groups that do not include the type, or any of the original species. Formal assignments of erroneous types also occur when generic names are not traced back to their original places of publication, or when ineligible species are designated as types. In dealing with the synonymy of genera previously treated under names that belong to other groups it will be convenient to have a distinctive term for this class of cases. Such misplaced names, applied to groups that do not contain the true type, may be indicated as *pseudotypic,* or false-typed.[5]

It should be expected that more critical analysis of taxonomic problems would lead to more definite distinctions and more precise terms. The older terminology was developed to facilitate the study of names, whereas it is now apparent that provision must be made for the study of types as another formal branch of biological taxonomy. Nomenclature has a history of three hundred years while systematic typology is only beginning. To gain further insight into these typological problems is obviously more important than to attempt premature applications of partial solutions. It may take fifty or a hundred years to transfer

---

Failure to regulate the application of names is the fundamental defect of the Paris and Vienna codes, and is hardly to be cured without thorough recasting.

[5] Thus the palm genus *Martinezia,* as treated by Kunth, Martius, and many later writers as relating to *Martinezia caryotæfolia* and its immediate relatives, was pseudotypic, for this species does not appear to be congeneric with any of the five species originally referred to *Martinezia* by Ruiz and Pavon. Hence it has been proposed to replace this pseudotypic use of *Martinezia* by a new generic name, *Tilmia.* (See *Bull. Torrey Bot. Club,* 28: 565.) The five original species of *Martinezia* belong to three natural groups, now recognized as distinct families, the first two species to the Cocaceæ, the third species to the Acristaceæ and the others to the Chamædoreaceæ. The third species, *M. ensiformis,* should be taken as logotype of *Martinezia* because the figures used to illustrate the generic characters evidently represent a member of the family Acristaceæ. Another reason for excluding the cocoid species from consideration as type is that they are mentioned as deviating from the "essential characters of the genus," in connection with the original description. The rule of the Vienna code, to the effect that the name of a subdivided genus should go with the majority of the species, would carry the name *Martinezia* over to the family Chamædoreaceæ. The making of such a rule shows that many European botanists were still working under the method of concepts, and were not accustomed to think of generic names as inseparably connected with type species.

the whole structure of biological taxonomy to the new foundation of types. To suppose that any permanent advantage can be gained by elaborating defective methods under forms of legislative enactments or judicial decisions is to show a limited appreciation of the nature of the subject and of its historical development. As long as legislation and interpretation are based on inadequate study, they can represent, at most, only a temporary consensus of opinion, for it is of the very nature of science to condemn and throw aside any doctrine or method that has proven inadequate or fallacious.

Terms Relating to Synonyms

The following classes of synonyms were recognized in 1907, in the American Code of Botanical Nomenclature:[6]

Homonym.—A name rejected because of an earlier application of the same name to another genus.

Typonym.—A name rejected because an older name was based on the same type.

Metonym.—A name rejected because an older valid name was based on another species of the same genus.

Hyponym.—A name not associated with a type.[7]

[6] *Bulletin of the Torrey Botanical Club,* 34: 167, 1907.

[7] Much confusion would be avoided by a consistent policy of withholding recognition of generic names that have not been associated with type species. Thus the name *Acoeloraphe,* proposed by Wendland in 1879 in an analytical key to genera of fan-palms (*Bot. Zeitung,* 37: 147), was not associated with a type, though evidently relating to a species mentioned in the same paper as *"Brahea serrulata."* This Florida palm differs from the Mexican type of *Brahea* in the leaf characters assigned to *Acoeloraphe* in the key and in the seed character indicated by the generic name, the albumen being solid instead of having a deep channel along the raphe. But *Acoeloraphe* being left without a type, another name, *Serenoa,* was proposed by Hooker f. in 1883 for *"Sabal serrulata* R. & S.*"* (Genera Plantarum, 3: 926). All subsequent writers have accepted Hooker's name, and *Acoeloraphe* should remain under *Serenoa* as a hyponym. Nothing has tended so strongly to bring the principle of priority into disrepute as the incontinent revival of abortive names, to replace properly established names in current use. No species was referred to *Acoeloraphe* until 1907, when Beccari (Webbia, 2: 107) applied the name *Acoeloraphe wrightii* to a Cuban member of a genus that had been described in 1902 under the name *Paurotis,* a Bahaman species, *Paurotis androsana,* being the type (*Mem. Torrey Bot. Club,* 12: 21). This transfer of the name *Acoeloraphae* to the genus *Paurotis* was followed by Sargent in 1911 (Trees and Shrubs, 2: 117), but Beccari's genus *Acoeloraphe* is a metonym of Paurotis, and is also pseudo-

Terms Relating to Type Species

Orthotype.—Type by original designation. A species designated as type in connection with an original publication of a generic name. A genus whose type was formally designated at the original place of publication is orthotypic.

Haplotype.—Type by single reference. A single species referred to a genus at the original place of publication, and on this account accepted as the type. A genus proposed with reference to a single species is haplotypic.

Logotype.—Type by subsequent determination. The historical type of a genus, selected from two or more original species. A genus whose type is selected from two or more original species is logotypic.

Pseudotype.—Erroneous indication of type. A species erroneously indicated as the type of a genus. A genus treated on the basis of an erroneous type, or so as to exclude the true type, is pseudotypic.

O. F. Cook

Bureau of Plant Industry,
U. S. Department of Agriculture,
March 13, 1914

---

typic, because of the original application of the name to *Serenoa*. Two species of *Paurotis* are supposed to exist in Florida, one that is identified with the Cuban *P. wrightii* (Grisebach & Wendland) and a local species, *P. arborescens* (Sargent).